

# Safety Leader's

## Discussion Guide

Measuring safety performance

Confined space

Electrical safety

Portable ladder safety

Compressed gases

Office safety

Falling from slips and trips

Chemical labels

Mechanical lifting devices

Violence in the workplace

Machine guarding

Hypothermia

Training techniques

2005





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**Dear Safety Leader:**

**Reducing workplace accidents is a win-win situation.**

The employee wins because he or she goes home safely each day ... which means the employee's family also wins.

The employer wins because accidents affect morale, decrease productivity and increase the employers' workers' compensation costs. Healthier workers mean a healthier bottom line.

One way to help keep your workforce healthy is by using this *Safety Leader's Discussion Guide*. Developed in cooperation with the Society of Ohio Safety Engineers, this guide covers a variety of safety meeting topics that give your employees the information they need to work safely. The articles are written in a style that encourages class participation and interaction. Lists of additional resources also are included with each topic.

Regular safety meetings help get your employees involved in the safety-management process and familiarize them with injury- and illness-prevention practices. Employee awareness and involvement will improve your company's safety performance; and when workers go home each day to their families with their health intact, we all win.

Sincerely,

Administrator/CEO  
Ohio Bureau of Workers'  
Compensation

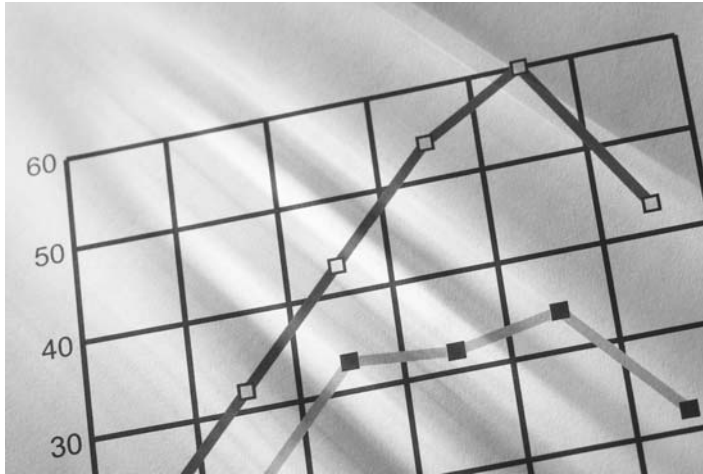
Superintendent  
BWC's Division of  
Safety & Hygiene

**P.S.: Plan now to attend the Ohio Safety Congress & Expo,  
March 29-31 at the Greater Columbus Convention Center.**

**Using the Safety  
Leaders' Discussion  
Guide is easy.**

- 1** Prior to the meeting, review the preparatory notes at the beginning of the chapter to familiarize yourself with the topic.
- 2** Supplement your presentation with safety examples found in your specific workplace.
- 3** For more information on the topic, contact BWC or refer to the list of additional resources included with each chapter.
- 4** Let us know what you think of the guide, by e-mailing the address listed at the end of each chapter:

[Safety@ohiobwc.com](mailto:Safety@ohiobwc.com)



## Measuring safety performance

By Ted Ingalls

Research your organization's statistical safety performance measures and bring the data to the session. For example, for the past two or three years: identify the recordable incident rate, number of injuries or illnesses, number of days lost and, if possible, the costs associated with incidents.

Many people subscribe to the philosophy of, "What gets measured, gets done." However, measuring the wrong things or areas that provide little useful information can be misleading.

Pose the following sets of questions to the group to stimulate thinking.

Ask the group which statement they prefer in each of the following sets of two statements.

- (1) Measures that are likely to predict future performance, or
- (2) Measures that quantify the number of incidents.
  
- (1) Measures that focus on identifying opportunities for improvement, or
- (2) Measures that quantify the costs of injuries.
  
- (1) Measures that show how the organization is aligned with a vision for safety excellence, or
- (2) Measures that quantify the numbers of days lost due to injury.

Ask which statement the group prefers in each of the sets of two statements below.

1. Measures that are likely to predict future performance, or
2. Measures that quantify the number of incidents.
  
1. Measures that focus on identifying opportunities for improvement, or
2. Measures that quantify the costs of injuries.
  
1. Measures that show how the organization is aligned with a vision for safety excellence, or
2. Measures that quantify the numbers of days lost due to injury.

The first statement in each set of questions refers to safety measures that provide information about day-to-day safety activities. The second statement in each set refers to traditional statistical safety measures. Statistical measures are less useful because they are developed long after incidents occur. They are lagging indicators.

Ask the group to name the measures your organization uses to track safety performance. Write the group's responses on a white board or flip chart. Measures that are likely to be named might include: lost-workday-case rate, severity rate, days lost, number of incidents or workers' compensation costs. At this point, share with the group the actual statistical safety performance measures you brought with you to the meeting.



**Key point:** Make sure the group recognizes that:  
The statistical safety measures are lagging indicators of performance and are not specific as to causes;  
The statistics are valid measures, but other measures of safety performance exist.

### The truth about statistics

Safety statistics are assumed to represent an accurate barometer for safety performance.

### Ask the group

What do numbers, like incident rates, fail to tell us? See if the group comes up with these answers:

- Statistical safety measures fail to tell us why incidents occur;
- Statistical safety measures fail to tell us what to do to improve safety performance.

In practice, statistics indicate that organizations should undertake preventive actions because people are hurt or made ill. The numbers also can provide trend information. However, specific data is needed to identify causes and corrective measures.

**Key point:** In addition to the statistics, it is helpful to measure the level and nature of safety activities that take place in the organization to provide a more complete picture of safety.

To drive the point home, ask the group if present safety activities are continued, and if the organization's incidence rate decreases by 50 percent next year, what the decrease will be attributed to. After the group discusses their thoughts, make the following point: If measures are not in place that specifically identify different or improved actions and activities, then it will not be possible to identify what caused the statistical improvement. Could it have been luck?

Another point to discuss with the group concerns what the safety statistics actually measure. Ask the group if the safety statistics measure prevention activities, or if the numbers measure undesirable events. The correct answer is safety statistics measure undesirable occurrences — injuries, pain and suffering.

**Key point:** Since safety statistics only measure things you don't want to occur (injuries), it makes sense to measure activities that you want people to engage in, those that promote safe performance. Examples of these types of activities include: number of safety audits, number of safety problems corrected, amount of safety education and number of safe behavior observations.

Summarize the discussion by saying safety statistics are useful for providing a broad view of safety performance — numbers on the "safety scoreboard." However, safety statistics are lagging indicators of safety performance and do not represent the organization's day-to-day safety activities.

### An effective approach

Since safety statistics do not measure desirable day-to-day safety-promoting activities, your organization should use additional measures.

Consider measuring the levels of upstream activity that promote safety each day throughout the organization. These activities educate, promote and facilitate safe operations. An organization that promotes safety performance daily demonstrates that safety is valued.

Ask the group to name day-to-day actions and activities that could foster safe performance in the organization. Write the answers on the white board or flip chart.

## Reference section

### Web sites

- Vermont Safety Information Resources PowerPoint presentation: <http://siri.uvm.edu/ppt/perfmeas/>
- Health & Safety Executive (U.K.): <http://www.hse.gov.uk/opsunit/meas2.htm>
- National Safety Council bibliography: <http://www.nsc.org/library/shelf/metrics.htm>

### Videotapes

BWC's Division of Safety & Hygiene video library has a number of videotapes on measuring safety performance. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our web site, [ohiobwc.com](http://ohiobwc.com).

**Ted Ingalls**, a certified hazardous materials manager, is president of Performance Management Consultants in Dublin, Ohio. The firm provides training and development in safety management and leadership, develops safety problem-solving teams, and helps organizations implement behavior-oriented safety systems and processes. It also conducts safety culture assessments, individual evaluations and technical safety training.

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## Confined space

By John N. Waller

Prior to class, identify any confined spaces at your facility. Determine if any of them are permit-required confined spaces, and bring copies of entry permits.

Let the group know that the intent of this training session is to familiarize them with the definitions of confined spaces, as well as some of the personal and operational protective equipment required for entry. It also will review specific requirements for personnel who may enter confined spaces, authorize or supervise such entry, or monitor entrants and associated conditions as well as emergency procedures.

Inform the group that completion of this training session will not qualify them to perform the duties of an entrant, attendant or entry supervisor. Regulations require specific training to perform these tasks.

Provide the group with OSHA's definition of a confined space, which includes these main requirements:

- Large enough and shaped so that an employee can bodily enter and perform assigned work;
- Limited or restricted means for entry or exit;
- Not designed for continuous employee occupancy.

A permit-required confined space is one that also has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere (too little or too much oxygen, combustible gas or toxic materials);
- Contains a material that has the potential for engulfing an entrant, such as grain or sand;
- Has an internal configuration where an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section;
- Contains any other recognized serious safety or health hazard.

Explain that if a workplace contains permit spaces, the employer must inform exposed employees by posting danger signs or by any other equally effective means.

Share with the group that entry into permit-required confined spaces requires a team effort. There are three primary assignments in a permit-required confined space entry: attendant, entrant and entry supervisor.

- Attendant—remains stationed directly outside the space and is primarily responsible for communicating with and monitoring the safety of the entrants;
- Authorized entrant—person authorized to enter the confined space and perform an assigned task;
- Entry supervisor—person responsible for determining if acceptable entry conditions are present, for overseeing entry operations, and for terminating entry.

### Entry permit

Tell the group a confined space entry permit must be issued prior to entry into a permit-required confined space. Among other things, the permit will include signatures of the attendant(s) and all authorized entrants who enter the confined space to acknowledge that all personnel have reviewed the permit requirements, test results and rescue planning prior to starting the job.

#### Additional considerations before entry

- You must secure, relieve, disconnect or restrain all energy sources.
- Evaluate the atmosphere in the confined space for oxygen level, flammability, temperature extremes, and/or any contaminants.
- Entry is prohibited when the oxygen level is over 23.5 percent.
- Oxygen levels less than 19.5 percent are considered immediately dangerous to life and health (IDLH) and require maximum respiratory protection, if entry is necessary.
- Flammable gas or vapor levels must be less than 10 percent of the lower explosive limit (LEL).

### Protective equipment

Discuss the two categories of protective equipment used for confined space entry: operational and personal.

1. Operational protective equipment is used to secure the work site and to address general hazards in the confined space and/or adjacent work areas.

Ask employees to name operational equipment that may be necessary for safe entry.

Answers include:

- Ventilation equipment;
- Fire protection equipment;
- Ground fault circuit interrupters;
- Lighting rated for hazardous locations;
- Grounding or bonding equipment;
- Warning signs;
- Barricade tape or cones;
- Ladders, scaffolding, or work platforms.

2. Personal protective equipment (PPE) which may be required for confined space entry protects employees from injury or inhalation hazards.

Ask employees to identify some personal protective equipment that may be necessary for safe entry.

Answers include:

- Respiratory equipment;
- Protective clothing;
- Protective footwear;
- Gloves;
- Hearing protection;
- Protective eyewear;
- Fall protection/arresting/retrieval equipment.

### Communication

Attendant(s) must maintain communications with entry personnel at all times. Ask the group to name the ways in which attendants can maintain communications with the entrant. Write down and discuss their responses.

### Rescue

Discuss that it is extremely important to pre-plan rescue procedures. Rescue action is best taken from outside the confined space by using retrieval equipment.

All emergency procedures, including procedures relating to emergencies outside of the confined space, must be reviewed with all entrants, attendants and other related personnel prior to entry. Required rescue equipment is specified on the confined space entry form.

### Group actions

Ask the group to identify any confined spaces in your facility. Also ask:

- Where are they?
- What makes them confined spaces?
- Are they permit-required confined spaces?
- Are employees correctly trained to enter these spaces?
- What are the dangers of entering one of these spaces, even just for a minute, to accomplish a task?

### Reference section

#### Web sites

- OSHA: <http://www.osha.gov/SLTC/confinedspaces/index.html>
- Oklahoma State University:  
<http://www.pp.okstate.edu/ehs/links/conspace.htm>  
<http://www.pp.okstate.edu/ehs/manuals/Confined.htm>
- NIOSH: <http://www.cdc.gov/niosh/injury/traumaconf.html>
- BWC: <http://www.ohiobwc.com/employer/programs/safety/SamplePrograms.asp> [https://www.ohiobwc.com/downloads/blankpdf/\(B\)%20Confined%20Space%20099.pdf](https://www.ohiobwc.com/downloads/blankpdf/(B)%20Confined%20Space%20099.pdf)

#### Videotapes

BWC's Division of Safety & Hygiene video library has a number of videotapes on confined space safety. These are available for loan to Ohio employers. Order a catalog by calling 1-800-OHIOBWC (ask for the video library), or visit our Web site, [ohiobwc.com](http://ohiobwc.com).

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## Electrical safety By Warren K. Brown

Review this material so you understand the presentation and the sequence of topics. Then, list examples of various electrical hazards found at home, office and the workplace. Have a few items to show the group, like a portable ground fault circuit interruptor (GFCI), an extension cord and a lockout lock.

Electricity is all around us. It is at home, work and in our recreational areas. It provides the energy that makes many of our tasks easier and life in general more pleasant. It powers machinery, provides heat and cooling, energizes lights, pumps our water, and powers home and office equipment. When used correctly, electricity essentially goes unnoticed. However, when something goes wrong, there may be injuries (even death), fires and costly equipment and building damage.

Inform the group that each year, more than 600 people die from electrocution and more than 30,000 receive non-fatal electrical injuries. Most of these incidents could be avoided.

Provide the group with the following basic definitions related to electricity:

- Current, measured in amperes, is the movement of an electrical charge;
- Resistance, measured in ohms, is the opposition to current flow;
- Voltage, measured in volts, is the measure of electrical force;
- Conductors are materials that have little resistance to electrical current flow;
- Insulators are materials that have high resistance to electrical current flow;
- Grounding is a conductive pathway, which permits electrical current flow to the earth. This is part of the electrical safety protective system.

Explain that when the human body becomes part of an electrical path or circuit, injuries, such as shock, burns, nerve/organ damage, vision loss, death, and secondary incidents, such as falls, can occur. The severity of an electrical shock depends on the quantity of current, the electricity's path through the body and the length of time the current passes through the body. Electrical short circuits can also result in fire, explosions and equipment damage.

Ask the group to identify root causes of electrical incidents. Their ideas should include:

- Unsafe equipment;
- Unsafe installations;
- Environmentally induced concerns;
- Unsafe work practices.

### What to look for

Ask the group to identify key electrical safety considerations — things everyone should look out for — relative to the equipment used at your facility.

Their answers should include at least the four major considerations listed below.

- Insulation protects workers from direct contact with energized equipment. Check wiring for intact insulation, and make sure wiring methods are used that protect the insulating properties from damage. For example, conduit may be used for protection or the wiring is behind the drywall in your house.
- Short circuits may result in the equipment becoming electrically energized. The worker who touches this equipment may become part of the path to ground and suffer an injury or worse. If there is damage to an electrical device, have a qualified electrician check it to

ensure there have been no electrical faults created.

- Grounding is an important safety issue. Grounding ensures exposed metal equipment is connected to a low-resistance electrical path to ground. If there is a failure in the insulation, the fault protection will operate, protecting the worker from an electrical shock.
- Protection. Appropriately enclose exposed current-carrying devices to prevent inadvertent contact that could result in bodily injury or equipment damage.

Ask the group to help develop a list of do's and don'ts for electrical safety. Write these responses down on a flip chart or white board.

Electrical safety do's include:

- Make sure the cord plugs match the receptacle;
- Make sure cord insulation is in good shape;
- Make sure cords are sized properly and match the expected work environment;
- Keep the area in front of electrical disconnect panels clear;
- Have trained electricians perform all electrical repairs;
- Use GFCI-protected cords and receptacles where appropriate;
- Be aware of equipment lockout and, depending on your training and involvement, take the necessary action.

Electrical safety don'ts include:

- Using cords in water or hot environments that could damage the insulation;
- Overloading receptacles with too many devices that may overheat the receptacle;
- Using cords where you should use permanent wiring;
- Using cords or devices that are not grounded.

Ask the group to identify the types of emergencies that could be caused by an electrical incident, and the actions that need to be taken.

- In case of an emergency take the correct action that you have been trained for.
- If there is a fire, call for trained firefighters before you attempt to extinguish the fire and attempt extinguishment only if you have had training in the use of fire extinguishers.
- Likewise, if a person is injured because of electrical contact, attempt only levels of first aid that you have been trained for and only after you have summoned medical help.

### Group action

Have employees do a walk-around inspection of their work area looking for electrical hazards. Schedule time for a group discussion of their findings and solutions proposed for each concern identified.

## Reference section

### Web sites

- OSHA: <http://www.osha.gov/SLTC/electrical/index.html>
- NIOSH: <http://www.cdc.gov/niosh/docs/2004-101/chap4.html>
- Consumer Product Safety Commission: [http://www.cpsc.gov/cpscpub/pubs/elec\\_sfy.html](http://www.cpsc.gov/cpscpub/pubs/elec_sfy.html)
- Department of Energy: <http://tis.eh.doe.gov/whs/electrical>
- Ohio BWC: <http://www.ohiobwc.com/employer/programs/safety/SamplePrograms.asp>

### Fire Code

- NFPA 70, National Electrical Code, National Fire Protection Association, 2002.

### Videotapes

BWC's Division of Safety & Hygiene video library has a number of videotapes on electrical safety. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our web site, **[ohiobwc.com](http://www.ohiobwc.com)**.

**Warren Brown**, a certified safety professional, is supervisor of safety and security for DMAX Ltd. in Fairborn, Ohio. In 1988, he was named a General Motors Corp. Safety Fellow, the company's highest safety honor. Brown also received Safety Professional of the Year recognition in 1987 from the American Society of Safety Engineers, All-Ohio Chapter, and for ASSE Region VII in 1988 and 1989. He is president of the Ohio chapter of the System Safety Society, and serves on the board of directors for the Dayton-Miami Valley Safety Council.

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## Portable ladder safety By Arne Larson

There are three basic types of portable ladders – stepladders, extension ladders and straight or single ladders. This safety talk presents information for choosing, using, storing and maintaining each type safely.

Obtain a stepladder and a short extension ladder to use in your presentation. Use a flip chart or note board to record questions and comments from the group as you discuss ladder safety.

Use the ladders brought into class to discuss ladder types, safe use tips and storage and maintenance information.

### Choosing the correct ladder

Inform the group to evaluate the job before choosing the type of ladder to use. Use stepladders where there is room to fully spread and lock the legs into place on a flat, firm surface. Extension ladders have two sections that fit together and may be expanded to reach higher than a stepladder. Use straight or single ladders in tight places where there is no room for a step or extension ladder. Ladders are divided into service classes and labeled accordingly:

- Type I ladders are for heavy-duty industrial use;
- Type II commercial ladders are for less-demanding business tasks;
- Type III are light-duty ladders intended for home use.

### Types of portable ladders

Discuss the various types of portable ladders with the group.

#### Stepladders

- Most commonly used type of ladder
- Available in lengths up to 20 feet
- Two sections spread apart and lock into place
- Made of wood, aluminum or fiberglass
- Must be placed on a level, flat surface

#### Extension ladders

- For access to heights above 20 feet
- Available in lengths up to 60 feet
- Consists of two separate sections that slide together
- Made of wood, aluminum or fiberglass
- Must have room to lean at proper angle

#### Straight ladders

- May be used in place of extension ladder
- Available in lengths up to 30 feet
- Consists of single ladder section
- Made of wood, aluminum or fiberglass
- May be extra narrow for access to confined spaces

### Tips for safe ladder use

- Thoroughly inspect every ladder before use.
- Take any damaged ladder out of service immediately.
- Ensure the ladder feet are on a firm, level surface.
- Ensure lock spreaders are fully open on stepladders.
- Always face a ladder when going up or down.
- Maintain at least three-point contact on a ladder (two feet and one hand).
- Don't carry tools and equipment when climbing a ladder — use a rope to pull them up in a bucket or pouch.
- Stay within side rails of a ladder; don't over-reach to either side.
- Don't sit or stand on the top step or rung of a ladder.
- Always get off a ladder before trying to move it.
- Do not use a ladder as a work platform.
- Never use a metal ladder near electrical lines or equipment.
- Tie off the top and bottom of an extension ladder when possible.
- Place the feet of a straight or extension ladder one foot away from the structure base for every four feet of ladder height.
- Ensure that the ladder extends at least three feet above the roof or support point when accessing a roof or other structure.
- Observe the minimum section overlap for extension ladders:
  - \* Heights up to 36 feet require minimum three-foot overlap;

\* From 36 feet to 48 feet requires a minimum four-foot overlap;

\* More than 48 feet requires a minimum five-foot overlap.

### Storage and maintenance

- Store ladders indoors in a clean, dry location when possible.
- Keep ladders clean and free of dirt, oil and grease.
- Check all nuts, bolts and rivets for tightness.
- Maintain non-slip cleats or feet in good condition.
- Make only repairs authorized by the manufacturer.
- Treat wood ladders with preservative – never paint.
- Lightly lubricate mechanisms such as spreaders on stepladders.

### Group actions

- Review the ladder types and classes used on your site.
- Practice setting up and climbing the ladders brought for class.
- Discuss any questions regarding safe usage tips.
- Ask attendees to inspect ladders in their work areas, and report any defects or problems found.

## Reference section

### Web sites

- OSHA:  
<http://www.osha.gov/Publications/osha3124.pdf>  
<http://www.osha.gov/SLTC/etools/construction/falls/ladders.html>
- eLCOSH:  
<http://www.cdc.gov/elcosh/docs/d0200/d000269/d000269.html>  
<http://www.cdc.gov/elcosh/docs/d0100/d000170/d000170.html>
- Oklahoma State University:  
<http://www.pp.okstate.edu/ehs/links/ladder.htm>

### Videotapes

BWC's Division of Safety & Hygiene video library has a number of videotapes on ladder safety. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our web site, **ohiobwc.com**.

**Arne Larson** is a safety specialist with the Lubrizol Corp.'s research and testing facility in Wickliffe, Ohio. He has 16 years of experience in safety and industrial hygiene.

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## Compressed gases By Andrew M. Pawuk

Be familiar with the types, uses and quantities of compressed gases at your workplace. Review material safety data sheets to be aware of the specific hazards pertaining to each of the gases. Have the information about specific hazards available during the training session for reference. Write group responses for all participants to see.

Explain to the group that a compressed gas is any gas stored and used at greater than normal atmospheric pressure. Used in many applications in the workplace, the gases may be inert, flammable or toxic depending on their intended need.

### Compressed gas storage

Ask the group to list safe compressed gas storage practices. Answers can include:

- Store cylinders with their cylinder valves in the closed position;
- Securely attach cylinder valve caps;
- Separate cylinders according to their contents. Place oxygen cylinders at least 20 feet from any flammable gas cylinders or combustible materials; or by a noncombustible barrier at least five-feet high and with a fire-resistant rating of at least 30 minutes;
- Identify empty cylinders, and store empty cylinders separate from full cylinders;
- Secure all cylinders while in storage and in use;
- Ventilate all cylinder storage;
- Keep cylinder storage away from fire and potential electrical hazards;
- Ensure all cylinders are labeled to identify their contents. Do not trust the cylinder color code as identification method for cylinder content (Medical gas cylinders are to be color coded, but check the label to be certain.);
- Return any cylinder to the supplier if the label does not identify contents;
- Store acetylene cylinders upright;
- Avoid dropping or striking cylinders.

### Cylinder transport

Discuss safe cylinder transportation practices with the group. Ask for ideas on safe methods for transporting compressed gas cylinders within your facility or your normal work locations.



Answers can include:

- Transport cylinders securely on a cart designed for cylinder use;
- Secure all cylinders during transport;
- Turn all cylinder valves off;
- Attach protective caps securely;
- Prohibit cylinders' use as rollers or supports for other equipment;
- Roll cylinders on their bottom edge when moving them short distances.

### Work practices

Let the group know that many basic safe practices are needed when working with compressed gases. Most are used everyday within common work practices. Items to include are:

- Inspect all cylinders, valves, regulators, hoses, torches and other equipment prior to use;
- Position the cylinder valve end up when in use;
- Place cylinders away from burning and cutting operations;
- Vent the cylinder by slightly opening (cracking) valve prior to attaching a regulator or any hoses or piping. Avoid being in front of the valve opening when this is done;
- Use the proper regulator for the cylinder to reduce pressure;
- Ensure that all connectors are free of oil and grease;
- Ensure that fuel gas and oxygen hoses are easily distinguishable. All other lines are to be identifiable;
- Disconnect hose couplings with a rotary motion and a pull;

- Open all valves slowly;
- Use a friction lighter to ignite any flame;
- Upon completion, close all valves;
- Close cylinder valves tightly;
- Close needle valves 'finger tight' to avoid damage to valve and/or valve stem;
- Vent all hoses;
- Use a diffuser regulated to less than 30 psi to blow away dust, dirt and debris.

### Personal protective equipment (PPE)

Explain to the group that before working with any compressed gas, it is necessary to take precautions to prevent injury. Use PPE to achieve this goal. Ask the group what PPE may be required. Answers include:

- Goggles or safety glasses with side shields;
- Face shields with appropriate filters if burning;
- Gloves while performing cutting or welding, or when moving and handling cylinders;
- Aprons, hats and arm protectors to prevent sparks from igniting clothing;
- Safety footwear to protect feet while moving cylinders.

### Group activity

- Inspect your work area for storage of compressed gas cylinders. Ensure all cylinders are stored properly.
- Ensure all hoses and piped compressed gas lines are identified.
- Monitor work practices to review for proper use of compressed gases and their cylinders.
- Ensure employees have necessary PPE to maneuver compressed gas cylinders and their contents.

## Reference section

### Web sites

- OSHA: <http://www.osha.gov/SLTC/compressedgasequipment/index.html>
- Compressed Gas Association (CGA): <http://www.cganet.com/Publication.asp?mode=sa>
- Oregon OSHA: <http://www.cbs.state.or.us/external/osha/pdf/pubs/fs09.pdf>
- Oklahoma State University: <http://www.pp.okstate.edu/ehs/links/gas.htm>
- Canadian Centre for Occupational Health & Safety: <http://www.ccohs.ca/oshanswers/chemicals/compressed/compress.html>

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**Andrew M. Pawuk** has contributed to the Safety Leader's Discussion Guide for 12 years. He is the safety and security manager at Lucas Metropolitan Housing Authority in Toledo. Pawuk previously served for 18 years as the safety director for major hospitals in Toledo and Columbus; as a safety and health specialist for Columbia Gas of Ohio; and as a private consultant.

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## Office safety By Ted Ingalls

Introduce the topic of office safety by discussing the fact that when we think of workplace injuries, office areas are often overlooked. A variety of hazards and potential injury-causing conditions and workstation arrangements can, and often do lead to injuries. Consequently, it is important to ensure to arrange and maintain office areas in ways that prevent injury and plans for emergencies.

### Office environment

Ask the group what types of injury causes are common in an office environment. See if the group identifies the following types of injuries:

- Falls;
- Strains and overexertion;
- Struck by falling objects from above;
- Struck by falling objects on the foot or leg;
- Striking against an object;
- Being caught in or between objects.

Ask what can be done to prevent falls. Examples might include:

- Maintain clear pathways where people walk;
- Close drawers;
- Clear and secure cords;
- Clean up spills promptly;
- Ensure carpet seams are flat and tight;
- Clear the path of obstructions;
- Move waste baskets out of the path of travel.

Also, use chairs and ladders correctly by:

- Avoiding excessive leaning back in a chair or tipping the chair back;
- Making sure chairs have five casters;
- Placing ladders so they are away from doors;
- Ensuring ladders have a solid footing that will not skip.

Ask what are some possible causes of strains and overexertion. Answers could include:

- Lifting heavy objects;
- Frequent lifting efforts;
- Twisting while lifting;
- Moving furniture, cabinets, etc.;
- Falling as a result of a trip or slip.

How to prevent strains and overexertion:

Share with the group how to prevent strains and overexertion injuries. If possible, use a mechanical device to lift and/or move large, heavy or cumbersome objects. Mechanical devices include two-wheeled dollies and carts. One can also ask for help with the lift or with moving furniture.

Review the mechanics of a good lift.

1. Use a solid stance with the feet approximately shoulder-width apart.
2. Bend your knees while lowering your body.
3. Get a firm grasp on the object.
4. Position the object as close to your body as possible.
5. When you lift, keep the back as straight as possible.
6. Lift using the muscles in the legs.
7. Do not jerk the load.
8. Do not twist; instead, turn with your feet.

### Office hazards

Ask what one could accidentally strike against or be struck by in an office environment. Possible answers might include:

- Office furniture, such as, desks, file cabinets and open drawers;
- Other people;
- Office machines;
- Doors.

Remind the group they could be struck by objects, too. For example:

- Items falling from shelves;
- Doors opening into a person's path;
- File cabinets tipping because one or more drawers are overloaded or open.

Ask the group to name the most dangerous piece of office equipment that represents a severe cutting hazard. The answer: Paper-cutting board.

Ask how good housekeeping practices can prevent injuries in an office environment. See if the group can identify these prevention practices. Prevention practices will:

- Reduce or eliminate tripping and slipping hazards;
- Reduce the hazard of fire;
- Eliminate blocked aisles and exits;
- Prevent objects from becoming falling hazards.

Review correct storage practices for the group.

- Store large, heavy objects at a level between the knee and the chest.
- Stack materials so they are secure.
- Store materials so they do not block exit pathways or access to fire extinguishers or pull stations.

Ask the group to name as many types of electrical hazards as they can. Their ideas should include:

- Damaged plugs at the end of flexible electrical cords;
- Electrical conductors partially or completely pulled away from the plug;
- Damaged insulation on electrical cords;
- Three-prong plugs with the grounding prong removed;
- Flexible electrical cords run through windows, doors or wall openings;
- Overloaded electrical wall receptacles.

Ask the group to describe what they would do if there was a fire emergency in their area. Their answer may depend on your organization's emergency plan; however, you might ask them to remember the term REACT.

- R – Remove persons from immediate danger!
- E – Ensure doors and windows are closed (smoke/fire spread prevention)!
- A – Activate the building alarm (inform the people)!
- C – Call the fire department!
- T – Treat all fires as dangerous!

### Group Action

Have the group note all the possible risks in their work areas and identify improvements that will eliminate or control the risks. They should share their findings and ideas with their supervisor.

## Reference section

### Web sites

- Centers for Disease Control:  
<http://www.cdc.gov/od/ohs/manual/ofcsfty.htm>
- Oklahoma State University:  
<http://www.pp.okstate.edu/ehs/links/office.htm>
- Evacuating High Rise Buildings:  
[http://www.osha.gov/OshDoc/data\\_General\\_Facts/evacuating-highrise-factsheet.pdf](http://www.osha.gov/OshDoc/data_General_Facts/evacuating-highrise-factsheet.pdf)
- Office Inspection Checklist:  
[http://www.ccohs.ca/oshanswers/hsprograms/list\\_off.html](http://www.ccohs.ca/oshanswers/hsprograms/list_off.html)

### Videotapes

BWC's Division of Safety & Hygiene video library has a number of videotapes on office safety. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our web site, [ohiobwc.com](http://ohiobwc.com).

**Ted Ingalls**, a certified hazardous materials manager, is president of Performance Management Consultants in Dublin, Ohio. The firm provides training and development in safety management and leadership, develops safety problem-solving teams, and helps organizations implement behavior-oriented safety systems and processes. It also conducts safety culture assessments, individual evaluations and technical safety training.

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## Falling from slips and trips

By Rick Snodgrass

Look up recent slip/fall injuries at your work place and in your community. Use these to encourage the group to share experiences or observations from home, work or elsewhere. Examples may include oil on a floor, gravel on a path, icy parking lot, wet floors or trip hazards on a work floor. We will cover falls from ladders or other elevations in another discussion.

Share with the group that falling is a sudden, unwanted experience. Every year many people are injured from falls caused by slipping, tripping or missing a step on stairs. These falls can be at home, work or anywhere else you travel. Most falls involved one or more of the following factors: footwear, surface, housekeeping, visibility, distractions and running. Offices, work shops, outdoors and construction areas have the same factors, but some factors are more important in different areas.

### Footwear

Many occupations have special footwear designed for comfort, for protection of the feet and to reduce the chance of slipping. Running shoes allow foot movement without friction and reduce heel impact. Outdoor work boots equipped with lugs afford better footing on rough ground. Oil resistant soles on work shoes reduce falls in metal shops or where oily film may be on the floors.

Ask the group what type of footwear they have chosen or are required to wear for their work areas. Ask what protection the shoes or boots provide against slips, trips and falls. Examples include:

- Steel toes to protect against dropped objects or kicking against obstructions at work;
- Oil resistant soles to reduce the chance of slipping on wet or oily floors;
- Lugged soles and heels to prevent slipping in muddy or wet outdoor areas;
- Ankle high boots to stabilize the foot on rough ground.

### Work surfaces

The surface you walk on has an important function in preventing slips and falls. Smooth surfaces, such as painted concrete, polished wood floors and marble can be slippery when wet. Construction sites can have rough dirt or gravel surfaces that can cause a twisted ankle.

Ask the group what type of surface hazards they find in their work sites. Examples include:

- Gravel;
- Rough ground;
- Oily concrete;
- Smooth wet floors;
- Carpets.

Ask the group to recommend ways to reduce the risk of slipping or tripping from these hazards. One way is to take very small steps and walk flat-footed on slippery surfaces. The heel striking as you walk is the least stable part of the step.

### Housekeeping

Ask the group if the housekeeping in their work areas is good. Good housekeeping might include:

- Keeping debris from operations or packaging cleaned up;
- Keeping floors dry and oil free;
- Setting up equipment for safe, free passage between operations;
- Keeping electrical wires from becoming trip hazards;
- Marking step-ups between floors or ramps.

Encourage the group to do their part in maintaining good housekeeping in their work areas.

### Visibility and distractions

Prevention of slips and trips requires everyone's attention. Good visibility—good lighting, proper eyewear and lack of glare—is needed to avoid trip hazards and slippery areas. Moving machinery, moving vehicles, tight work areas and other distractions make it difficult to remain alert to hazards. Another hazardous action is carrying bulky items that block your view of the floor or stairs.

Ask the group to describe visibility problems or distractions in their work areas. Have them review the preventive actions they might take to move about safely. Examples of visibility problems and distractions include:

- Blind corners;
- Going from dark areas into sunlight;
- Loading docks where lift trucks are used to empty trailers.

### Running

Most workplaces have rules against running, which is the least stable method of moving about for people. As the foot strikes the ground harder, the speed of the body causes instability.

### Group actions

Ask the group to:

- Identify their company rules on running at work;
- Identify and report any slip/trip hazards in their areas;
- Evaluate the condition of their footwear and replace them as necessary;
- Watch for any nearby hazardous activities.

## Reference section

### Web sites

- OSHA:  
<http://www.osha.gov/SLTC/walkingworkingsurfaces/index.html>
- CCOHS:  
[http://www.ccohs.ca/oshanswers/safety\\_haz/falls.html](http://www.ccohs.ca/oshanswers/safety_haz/falls.html)
- National Safety Council:  
<http://www.nsc.org/mem/educ/slips.htm>
- National Agriculture Safety Database:  
[http://www.cdc.gov/nasd/menu/topic/back\\_safety.html](http://www.cdc.gov/nasd/menu/topic/back_safety.html)
- North Carolina State University:  
<http://www.ncsu.edu/ehs/www99/right/training/meeting/slips.html>

### Videotapes

BWC's Division of Safety & Hygiene video library has a number of videotapes on slips, trips, and falls. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our web site, [ohiobwc.com](http://ohiobwc.com).

**Lowell E. (Rick) Snodgrass** began his career in occupational safety, health and environmental control in 1971. He has managed these programs for Ferro Corporation, Nestle' USA, Battelle Memorial Institute, and KTH Parts Industries. Snodgrass is a past president of the Society of Ohio Safety Engineers and the Northern Ohio chapter of the American Industrial Hygiene Association. He has authored Safety Leader's Discussion Guide articles since 1982.

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| CHEMICAL NAME |                          |
|---------------|--------------------------|
| CAS#          |                          |
| HEALTH        | <input type="checkbox"/> |
| FLAMMABILITY  | <input type="checkbox"/> |
| INSTABILITY   | <input type="checkbox"/> |
| SPECIFIC      | <input type="checkbox"/> |

## Chemical labels By Tim L. Govenor

Find several products at your work site that contain hazardous chemicals. Use the product labels to illustrate examples in the main section of this program. Try to find labels with both written and illustrative hazard warnings.

As defined in OSHA's Hazard Communication standard, a label "means any written, printed or graphic material, displayed on or affixed to containers of hazardous chemicals." This program will describe common types of labels and graphics found on hazardous chemical containers and review the information provided to the employee by the label.

Share with the group that OSHA requires containers containing hazardous materials to have labels with the following information:

- The chemical's name;
- The physical and health hazards of the chemical;
- The manufacturer's name and address;
- The manufacturer's emergency phone number.

The U.S. Department of Transportation (DOT) has established labels to be used when transporting hazardous materials. Commonly found on shipping containers, these labels are required to be displayed prominently and to be easily readable from a distance. The graphic labels convey the hazard of the material but not the identity of the chemical. Several examples are shown below. Ask the group what each label conveys, and where they have seen these labels.

### Hazardous chemical container labels

Tell the group that in addition to the information conveyed by these DOT labels, hazardous chemical container labels provide common names and chemical names of the ingredients. The common name is usually the product name, and it will match the name on the material safety data sheet (MSDS). The chemical name tells you the product's contents. For example, Zip Strip contains the hazardous chemicals methylene chloride, trichloroethylene and methanol.

Using the samples of container labels you gathered before the session, ask participants to provide the common name and the chemical ingredients.

Make sure that everyone understands labels must also provide the name of the product manufacturer and the phone number where emergency information can be obtained 24 hours a day, seven days a week.

## Examples of DOT labels



This label indicates the material contains and gives off oxygen or similar oxidizing chemicals. They accelerate the burning of any material by providing more oxygen than the air does.



This label symbolizes corrosive materials that will destroy materials and tissues through chemical corrosion.



This label conveys the message the liquid is flammable. At room temperature, static, sparks or other ignition sources can ignite the liquid.



This label informs you the solid material is flammable. It is not as common as others. These solids will ignite readily and burn violently. Some do so in contact with humid air.

Have participants find and share this information from the labels.

The last piece of information that must be conveyed on a label is the body part or organ that may most likely be damaged by the chemicals in the product. This information is referred to as the target organ(s). The most common organs affected by chemicals are the lungs, skin, eyes, mucous membranes, kidneys, liver, reproductive systems and the central nervous system.

Ask participants to find information on target organs from the labels.

### Group actions

Given the information presented, identify actions the group can take to maintain or improve safe practices. You might suggest everyone take the following actions:

1. Ensure that chemical labels in the workplace have been maintained, are legible and have not been removed or defaced;
2. Suggest changes where necessary to handle the chemical in a safer manner;
3. Ask the group to look at products in their homes and identify how many contain hazard information.

## Reference section

### Web sites

- OSHA: <http://www.osha.gov/SLTC/hazardcommunications/index.html>
- Oklahoma State University: <http://www.pp.okstate.edu/ehs/modules/hazcom/label.htm>
- Hazardous Materials Identification System: <http://www.paint.org/hmis/index.cfm>
- NFPA Fire Diamond: <http://www.ilpi.com/msds/ref/nfpa.html>

### Videotapes

BWC's Division of Safety & Hygiene video library has a number of videotapes on labeling and hazard communication. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our web site, [ohiobwc.com](http://ohiobwc.com).

**Tim Govenor** is a certified industrial hygienist and certified safety professional employed by The Ohio State University, where he is semiretired and serves as the university's chemical hygiene officer. Govenor has served as president of the local chapters of the American Society of Safety Engineers, American Industrial Hygiene Association and Society of Ohio Safety Engineers.

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## Mechanical lifting devices

By Joe Hammond

Prior to the session, observe associates whose work can be eased by using mechanical equipment for lifting objects, and thus, lessen the potential for muscular sprains and strains.

It is only natural to simply pick up and move items. In doing so, we expose ourselves to the major cause of injury in the workplace. The goal of this discussion is to urge people to consider the use of mechanical equipment for lifting, no matter how basic.

### **The only safe lift is no lift!**

Ask the group what that statement means. If you consider using means other than brute strength when moving material, products or even people in the case of health care, you can save yourself a great deal of pain and effort, and be more productive. The challenge is to lessen the stress on your back, by transferring that stress to equipment that lifts for you.

Explain to the group what is meant by mechanical lifting devices. They are any piece of equipment that helps transfer material from one point to another.

Ask the group to identify all the types of mechanical material moving devices they can think of. Answers include:

- Hoists;
- Conveyors;
- Fork trucks;
- Pallet jacks;
- Two- or four-wheel carts, and even pry bars.

You may wish to have some within view that are used in your facility.

Ask the group what the benefit is in using such equipment. Possible answers include safety, ease, speed and ability to move a greater quantity.

Then, ask the group to provide examples of mechanical lifting devices in use at your facility. In addition, ask the group what might improve the material handling functions.

In working with mechanical handling devices, remember the five A's for ensuring their use.

- **Affordable:** You won't purchase the equipment if it cannot meet a cost/benefit ratio. However, saving the cost of one back injury will usually pay for a great deal of equipment.
- **Available:** Obtain sufficient quantities of the equipment so they are in the work area where they are needed.
- **Accessible:** If a great deal of travel is necessary to reach the devices, employees may not use them.
- **Advantageous:** The user needs to be convinced that using these tools makes sense and is a benefit to his or her job.
- **Appropriate:** A forklift may not be necessary for a box of marshmallows.

The message is to encourage everyone to see the value in using equipment to make their work easier, simpler and safer. Remember, "Don't work hard, work smart!"

### Group activity

Have the group review their work sites and identify ideas for eliminating or controlling sprain and strain exposures by using mechanical lifting devices. Ask the associates to suggest these improvements to their supervisors.

## Reference section

### Web sites

- BWC: <https://www.ohiobwc.com/downloads/blankpdf/MaterialsHandling.pdf>
- OSHA's eTool on materials handling: <http://www.osha.gov/SLTC/etools/electricalcontractors/materials/index.html>
- Lawrence Livermore National Laboratory: [http://www.llnl.gov/es\\_and\\_h/hsm/doc\\_15.02/doc15-02.html](http://www.llnl.gov/es_and_h/hsm/doc_15.02/doc15-02.html)

### Videotapes

BWC's Division of Safety & Hygiene video library has videotapes on material handling and lifting safety. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our web site, [ohiobwc.com](http://www.ohiobwc.com).

**Joe Hammond** is a certified professional environmental auditor and occupational safety and health technologist. After a 27-year career with BWC, Hammond now provides safety training and consulting services to clients throughout Ohio. He is an authorized OSHA 10- and 30-hour course trainer, and makes frequent public presentations to both general industry and construction groups.

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## Violence in the workplace

By Mark J. Mullins

### Preventing and responding to the disruptive, threatening and violent behavior of co-workers

Obtain a copy of your facility's workplace violence policy and procedures to review with the employees. Review past records to see if any workplace violence infractions were committed. Bring copies with you for discussion. However, do not mention the names of individuals identified in these reports.

Workplace violence has emerged as an important safety and health issue in today's workplace. Given the many millions of workers, the probability is very low you will be involved in a violent workplace incident leading to serious injury. Still, prevention is critical. The most extreme form of workplace violence, homicide, is the second-leading cause of fatal occupational injuries in the United States. Nearly 1,000 workers are murdered and 1.5 million are assaulted in the workplace each year. According to the federal Bureau of Labor Statistics, there were 709 workplace homicides in 1998 accounting for 12 percent of the total 6,026 fatal work injuries in the United States.

The information presented in this chapter highlights stresses and risks in the work environment. Knowledge and preparation are the best ways to minimize and avoid violence and disruptions in the workplace.

Company policies should prohibit disruption and obstruction of functions and activities, verbal threats and behavior endangering the health or safety of any individual.



Ask the group to define disruptive, threatening or violent behavior.

- Disruptive behavior disturbs, interferes with or prevents normal work functions or activities. Examples: yelling, using profanity, waving arms or fists, verbally abusing others and refusing reasonable requests for identification.
- Threatening behavior includes physical actions short of actual contact or injury; for example, moving closer aggressively, making general oral or written threats to people or property.
- Violent behavior includes any physical assault, with or without weapons; behavior that a reasonable person would interpret as being potentially violent (throwing things, pounding on a desk or door or destroying property), or specific threats to inflict physical harm, such as a threat to shoot a named individual.

### Maintaining a safe workplace

Ask the group to list preventive steps to maintain a safe workplace.

Workplaces prone to disruptive incidents are often characterized by high levels of unresolved conflict and poor communication. Conflict at work is normal, but must be addressed promptly and effectively, not avoided or suppressed. You can reduce or prevent disruptions by:

- Identifying someone in your organization that employees can talk to anonymously about their concerns. You can achieve this by facilitating a workplace environment that promotes a healthy, positive means of airing and resolving problems (methods that do not disrupt the workplace or harm or frighten others);
- Training to improve the conflict-management skills of managers and staff, to set and enforce clear standards of conduct and to provide help, such as mediation and counseling to address conflicts early;
- Developing a hot line where employees can call in or write in to anonymously stress their concerns.

You may need to periodically post a generic reply so employees know their concerns have been addressed.

### Problem indicators

Ask the group to list indicators of problem behaviors. Possible answers for behavior problems include:

- Upset over recent event(s) (work or personal crisis);
- Makes major change in behavior, demeanor, appearance;
- Withdraws from normal activities, family, friends and co-workers;
- Intimidating, verbally abusive, harasses or mistreats others;
- Challenges/resists authority;
- Blames others for problems in life or work; suspicious, holds grudges;
- Uses/abuses drugs and/or alcohol;
- Makes unwelcome obsessive romantic attention;
- Stalking;
- Makes threatening references to other incidents of violence;
- Makes threats to harm self, others or property;
- Possesses or is fascinated with weapons;
- Has known history of violence;
- Communicates specific proposed act(s) of disruption or violence.

Possible answers for attitude problems include:

- Is isolated or a loner;
- Is morally superior, self-righteous;
- Feels entitled to special rights and that rules don't apply to them;
- Feels wronged, humiliated, degraded; wants revenge;
- Feels without choices or options for action except violence.

### Group action

Ask the group how they would respond to violent or threatening behavior in the workplace, and review your company's policy with regard to appropriate response.

## Reference section

### Web sites

- BWC's one-hour safety presentation: <http://www.ohiobwc.com/employer/programs/safety/SandHTrain.asp>
- NIOSH: <http://www.cdc.gov/niosh/injury/traumaviolence.html> <http://www.cdc.gov/niosh/docs/video/violence.html>  
<http://www.cdc.gov/niosh/violdev.html>
- OSHA: <http://www.osha.gov/SLTC/workplaceviolence/index.html>
- Office of Personnel Management: <http://www.opm.gov/ehs/violence.asp>
- Oklahoma State University: <http://www.pp.okstate.edu/ehs/links/violence.htm>
- Federal Emergency Management Agency: [http://www.fema.gov/library/lib\\_viw.shtm](http://www.fema.gov/library/lib_viw.shtm)
- Bureau of Justice Statistics: <http://www.ojp.usdoj.gov/bjs/abstract/vw99.htm>

### Videotapes

BWC's Division of Safety & Hygiene video library has a number of videotapes on workplace violence. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our web site, **ohiobwc.com**.

**Mark J. Mullins**, CSP, CHMM, is the health and safety supervisor for Lubrizol Corp. in Painesville, Ohio. He has been with the corporation for 33 years, and has 20 years of experience in occupational health and safety. Mullins is past president of the Society of Ohio Safety Engineers and is vice-president of the Northern Ohio chapter of the American Society of Safety Engineers. He also is on the board of directors of the Greater Cleveland Safety Council.

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## Machine guarding, the hidden danger

By Daniel E. Gleghorn

The purpose of this session is to familiarize everyone with the importance of machine guarding, and how to recognize hazards of moving machinery.

Examples are an excellent way to help inform trainees of how guarding or the lack of guarding might affect them. Collect information about injury incidents or near misses in your facility. You also can include examples of situations in the attendee's home environment.

Employees often are injured or killed by moving parts that are not recognized as hazards or dangers; or by moving parts you might assume no one would put any part of their body into.

Ask the group to name instances where they or someone they know were injured or had a near miss from an unguarded part of equipment at work or at home. If there is a white board or flip chart available, write their responses down. (See possible responses in the table below.)

Share with the group that the hazards associated with a lack of machine guarding are not always recognized. Often it is easier to be unsafe than to be safe. Sometimes we rationalize that because the job will take so little time or because we have always done it this way, we choose to ignore the risks.

Inform the group there are three major types of machine hazards:

- Point of operation;
- Power transmission;
- Miscellaneous moving hazards.

| Type of machine | Type of operation                | Type of injury                      |
|-----------------|----------------------------------|-------------------------------------|
| Power press     | Taking finished part from dies   | Crush injury (amputation) of finger |
| Drill press     | Adjusting speed by moving v-belt | Laceration to fingers               |
| Conveyor        | Crawling under                   | Caught hair around roller           |
| Part feeder     | Adjusting stroke                 | Crushing injury to fingers          |
| Circular saw    | Cross-cutting wood               | Laceration of finger                |

We must also guard the operator's controls.

Ask the group who in the facility might be exposed to machine guarding hazards or dangers. Answers include:

- Maintenance workers;
- Set-up people;
- Production workers;
- Visitors to the facility;
- Employees working at home.

### Understand the principle of guarding hazards

Ask the group to list the three major types of hazards. The answers are:

- Point of operation: the area of a machine where work is performed, such as cutting, forming, grinding, boring, shaping;
- Power transmission: where power is transmitted from power sources to equipment (gears, chains, flywheels, pulleys, belts, cams, couplings, spindles, connecting rods);
- Miscellaneous moving hazards (feed mechanisms, reciprocating, rotating and transverse moving parts, flying material, sparks).

Make sure everyone understands that point-of-operation hazards, the most obvious examples, are not the only hazards or danger points on a piece of equipment.

Ask the group if the equipment operator is the only person exposed to danger from the point of operation. The answer is no. An observer or a supply person may be exposed to more but less obvious hazards or danger. Light curtains (presence-sensing devices), two-hand controls or barrier guards can protect the operator, whereas an observer may be able to access the point of operation from an unprotected side, the back or from underneath the equipment.

Remind the group that not all guarding devices provide complete protection. The operator may be able to reach the point of operation before the danger portion of the operation cycle has been completed if he or she can move faster than

that portion of the equipment cycle, reach under or around the electric eye curtain, or under, around or through the barrier guard.

Ask the group why power transmission hazards are so dangerous. The answer is that workers may get body parts or clothing caught by gears, chains, flywheels, pulleys, belts, cams, couplings, spindles or connecting rods.

Remind the group that people get their hands caught in V-belts and pulleys or chains and gears when a piece of equipment cycles unintentionally, or when it is activated by someone who is unaware an employee is working on the equipment.

Ask the group how a person can be injured by miscellaneous moving parts. The answer is that this type of incident usually occurs when a person is working in an area while the equipment is operating. An employee might be making an adjustment on the back of a piece of equipment and get caught by the movement of a shuttle or by parts of the equipment moving in close proximity to one another. This can happen when a person is setting up the equipment.

Remind the group that injuries do not always happen because an employee deliberately puts a body part in harm's way. Many times a person will slip and reach out to protect him or herself, placing a hand or other body part in the hazard area or danger zone.

### Group actions

1. Identify hidden hazards or dangers in the point of operation, power transmission and miscellaneous moving parts of the equipment in your facility or at home.
2. Identify and report equipment that is not properly guarded.
3. Follow your company's policies and procedures for safe setup of equipment and lockout/tagout procedures.
4. Ensure guarding methods are in place and being used.

## Reference section

### Web sites

- OSHA: <http://www.osha.gov/SLTC/machineguarding/index.html>
- Oklahoma State University: <http://www.pp.okstate.edu/ehs/links/machine.htm>
- North Carolina State University – Manual: <http://www.ncsu.edu/ehs/www99/right/handsMan/workplace/machine.html>

### Videotapes

BWC's Division of Safety & Hygiene video library has a number of videotapes on machine guarding safety. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our web site, **ohiobwc.com**.

**Daniel S. Gleghorn**, a certified safety professional, has 35 years of experience in occupational safety and health. He is executive vice-president of American Safety & Health Management Consultants Inc.; and previously managed industrial health and safety issues for various subsidiaries of the Goodyear Tire & Rubber Co. Gleghorn was named All-Ohio Safety Professional of the Year for 1990.

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## Hypothermia, a subtle foe

By Ted Ingalls

Examples are a great way to help people see how information about hypothermia might apply to them. Collect information about actual examples, or think of how people have, or might become hypothermic, both at work and in their home environment. If specific examples are not available, think of instances where people are exposed to temperatures below 40 degrees and when their skin could become wet.

We often get chilled, but sometimes the cold goes beyond our body's tolerance. People can become hypothermic when exposed to temperatures in the 30 degree to 50 degree range, or below. Taking precautions and being prepared will prevent potential catastrophes, including death.

Ask those in attendance to name instances where people (at work or at home) could become so chilled that they could suffer from hypothermia, frostbite or even death. If there is a white board or flip chart available, write their thoughts down. Following are some examples:

|              |                                   |  |
|--------------|-----------------------------------|--|
| Hunting      | Working outdoors                  | Falling in a pond, stream or lake                              |
| Fishing      | Becoming stranded in a snowstorm  | While perspiring on a hike, being exposed to brisk cool breeze |
| Snowmobiling | Sliding off the road in a vehicle | Being a spectator at outdoor sports                            |

Let the group know that hypothermia can kill due to exposure and exhaustion. The moment your body begins to lose heat faster than it produces it, you are undergoing exposure and becoming hypothermic.

### Understand the physiology

Ask the group how cold it must be for there to be a risk of hypothermia. See if the group understands hypothermia can occur at surprisingly moderate temperatures. You can become hypothermic on a 50-degree day with wind and rain.

Make sure everyone understands the amount of heat you can generate through metabolism and exercise is minimal in comparison to the rate you will lose to cold environments. The muscles and metabolic chemical reactions generate heat. About 90 percent to 95 percent of this heat is lost through the skin.

Ask the group what the body does to compensate when a person gets cold. The answers are:

- The blood vessels in the skin and extremities constrict or narrow to prevent heat loss;
- Shivering, which is an involuntary contraction and relaxation of muscle tissue occurring on a large scale intended to produce heat.

Ask the group if it is a good idea to give someone suffering from hypothermia alcoholic beverages. The answer is "No." Alcohol accelerates hypothermia by interfering with the body's ability to shiver.

One can voluntarily exercise to stay warm. The large muscles of the leg produce more heat than smaller muscles elsewhere. Walking or just repeatedly stepping up and down on a rock produces far more heat than shivering.

### Know what to do

Ask the group how you can prevent hypothermia. The answers are: reduce heat loss and increase heat production. However, these concepts won't help if they are not applied.

Share with the group these four important prevention steps:

- Minimize air movement. You can withstand more cold in still air than you can when air is moving about you.
- Minimize contact with water. Water conducts heat away from your body 240 times faster than dry air. When water immersion occurs, take immediate action to replace all wet clothing with dry clothing, and get to a warm area.

- Minimize sweating. Sweat-dampened clothing loses much of its insulating qualities and increases your level of evaporative heat loss.
- Eat correctly. You should eat three well-balanced meals each day, supplemented by small amounts of food (preferably carbohydrates) periodically during the day.

### Clothing do's and don'ts

Share these tips for dressing appropriately in cold weather:

Use layers of clothing. Adequate clothing traps layers of warm air next to your body.

Wool is an excellent choice. It is durable and insulates well, even when dripping wet. Down is the best insulator for its weight, but only when it is dry.

Polyester fibers substitute for down in wetter climates. They retain much of their insulating value when wet, but are heavier.

Cotton denim is just about the worst fabric you can wear in cold and wet weather. If the cuffs of your jeans are out where they can get wet, the wicking action of cotton carries the water upwards.

### Actions you can take

Recommend to the group the following action steps:

1. Understand that cool (30 degrees to 50 degrees) damp environments can be as lethal as those of 20 degrees or colder.
2. Be prepared to prevent hypothermia. Anticipate the possibility of exposure, have the right clothing available, and understand how to combat hypothermia.
3. Once you realize you are in potentially hypothermic conditions, take immediate and positive action.

## Reference section

### Web sites

- Guide to Hypothermia Sites on the Internet: [www.directory.net/Health/Conditions\\_and\\_Diseases/Wounds\\_and\\_Injuries/Hypothermia](http://www.directory.net/Health/Conditions_and_Diseases/Wounds_and_Injuries/Hypothermia)
- Outdoor Action Guide to Hypothermia and Cold Weather Injuries: <http://www.princeton.edu/~oa/safety/hypocold.shtml>
- Wind Chill: <http://www.nws.noaa.gov/om/windchill/index.shtml>

### Videotapes

BWC's Division of Safety & Hygiene video library has several videotapes on hypothermia and winter safety. These are available for loan to Ohio employers. Order a catalog by calling **1-800-OHIOBWC** (ask for the video library), or visit our web site, **ohiobwc.com**.

**Ted Ingalls**, a certified hazardous materials manager, is president of Performance Management Consultants in Dublin, Ohio. The firm provides training and development in safety management and leadership, develops safety problem-solving teams, and helps organizations implement behavior-oriented safety systems and processes. It also conducts safety culture assessments, individual evaluations and technical safety training.

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# Training

## Training Techniques By Amy Stewart

A guide for safety leaders

Preparation is important. Training sessions can be so much better, if a little time is invested in advance to prepare for the training session. Follow these simple steps to develop a great training session.

The first step in training is to prepare for the training session by answering these basic training questions and taking action to get started.

### Preparation

Who will be the audience? Identify the characteristics of who will attend. For example, how much do they know about the subject, what are their interests and how will they use the information.

What are the training objectives? What do you want the attendees to take away with them? Will you try to sell them on ideas, embrace change or utilize new methods? Will this be an informational training session? To provide your training session with a well-defined purpose, formulate clear and specific objectives rather than general statements. At the completion of the training, what do you want attendees to know or understand? Are there specific actions you want them to take? Is it possible to connect the training to the company's safety goals or safety vision?

Where will the meeting take place? If possible, arrange to meet in an area with ample space that is free from distraction. Consider seating needs, including whether or not you will need tables on which to write. Will there be adequate lighting, and will it be necessary to dim or adjust the light levels? Should you furnish water or other beverages? Are toilet facilities nearby? Training is more effective if people are comfortable and when training sessions are well planned and engaging.

When is the best time to schedule the training? Prepare well in advance. Try to pick a convenient time, one that takes into account people's schedules, production commitments, and holidays. Try not to schedule at the beginning or end of the month or on Mondays. Fridays can sometimes be difficult, as well. Mornings or early in the shift are better than afternoons or late in the shift.

Prepare by gathering materials, policies, procedures, equipment, news articles, examples and anything else to help make the training interesting and visual. Collect historical information you can share, such as previous incidents, incidents that occurred at other organizations, workers' compensation information, pictures/slides, etc. It is often helpful to show examples of good performance, equipment, practice and process, so that attendees can see what "good" looks like.

### Audience participation

Consider the amount of audience participation you desire. Information transfer is greatly improved, if people are provided the opportunity to participate during training.

Here are participation techniques you may wish to consider.

- Use question and answer sessions to develop audience interaction and to test knowledge.
- Use small-group breakout sessions that permit groups of individuals to develop ideas and thoughts in response to a question or a challenging problem.
- Following videotape presentations, ask the audience what they thought were the important points, or how the information applies to their work setting. Record thoughts on whiteboard or flip chart for review.
- Ask a participant to read a short paragraph (prepared in advance) that explains an important point. This information could be from a news clipping, procedure or incident review.
- Give each participant a short quiz to answer. After completing the quiz, have participants, one at a time, answer a question and see if everyone agrees. If not in agreement, there is a learning opportunity.

### Audio/visual planning

Audiovisual materials can greatly improve learning. Collect or develop overhead transparencies, slides, pictures, PowerPoint slides, videotapes or audiotapes that demonstrate key points or help to supplement key topics. One needs to be careful, however, not to overdo it. Audio/visual materials are supplementary and should not become the presentation.

## Organizing the training session

The second step is to organize the training session. By formatting the session into sections, the presentation will be effective, go smoothly and you will achieve the training objectives. Organize by dividing the training session into three sections.

### Section one, the introduction.

Consider how you want to introduce people, yourself and generally create a relaxed atmosphere. Introduce the topic and why people have been invited to the training session, along with the purpose of the training.

Discuss the training objectives, and then ask the participants what they want to take away from the training session. It is advisable to write the training objectives and the participants' "take-aways" on a white board or flip chart.

### Section two, the main part of the training session.

In this section, preparation, audience participation and audio/visual planning come together.

First, get the participants' attention by telling a brief story or relating an incident that illustrates the importance of safety in relation to the training session objectives.

Second, get into a thorough and honest discussion of how the training topic relates to those in attendance, to their families and to the organization. For example: Why do people not follow safe work practices? How does not wearing safety equipment affect productivity? What is necessary to do the job safely and productively? The key is to create honest dialogue, not a negative, destructive, anti-organization movement.

Third, discuss a safe way of operating, such as how the procedure works, or how people can help one another to work safely, or how to get assistance, or what to do when an emergency occurs. Help the audience think through their decision-making process when they are confronted with the topic.

Fourth, spell out the benefits of making the right choice. Help people to visualize the good things ahead, if they make the safe choice. Be careful not to threaten with negatives. Instead, help attendees see how they and the organization benefit from working safely.

### Section three involves influencing action.

You want the attendees to use the information on the job right away and to make the right decisions. So, give them easy steps to take. Once people have made a decision and take a modest step toward working safely, they have done the hardest work.

What might be an easy step? If they are too numerous to name, an effective way is to create a to-do list. What needs to be done differently, or what will each person start to do when they are back on the job? Identify other actions that need to be taken in support of working safely, and ask for volunteers, or assign people to carry out these assignments.

Conclude the training session by summarizing the to-do list and all assignments. If possible, inform participants of the next training session date, time and location. Also, document the training activity.

## Reference section

### Web sites

- Adult Learning Styles: <http://www.cyg.net/~jblackmo/diglib/styl.html>
- Help! They Don't Speak English Starter Kit: <http://www.escort.org/products/yahelpkit.html>
- International Association for Continuing Education and Training: [www.iacet.org](http://www.iacet.org)
- OSHA's training resources: [http://www.osha.gov/fso/ote/training/training\\_resources.html](http://www.osha.gov/fso/ote/training/training_resources.html)

### Standards

- American National Standard, Criteria for Accepted Practices in Safety, Health and Environmental Training, ANSI Z490.1-2001, American National Standards Institute, 2001.

**Amy Stewart** is a certified safety professional and a transportation research scientist at Battelle Memorial Institute in Columbus, Ohio. She has been published in the American Traffic Safety Association's Journal of Traffic Safety; and has written several transportation safety training manuals and videos. In 1997, Stewart was named Safety Professional of the Year by the All-Ohio Chapter of the American Society of Safety Engineers.

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# 2005

# Safety meeting log

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## notes

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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